

WHAT IS CLAIMED IS:

1 1. A laser system comprising:
2 a laser generating a laser beam with a first frequency;
3 a non-linear optic disposed in an optical path of the beam, the non-linear
4 optic effecting a conversion of the first frequency to a second frequency, the conversion
5 varying with an angle of the non-linear optic relative to the optical path; and
6 a first member having a first thermal coefficient of expansion, the first
7 member thermally coupled to the non-linear optic so that thermal expansion in a
8 dimension of the first member with a change in temperature of the non-linear optic effects
9 a change in the angle of the non-linear optic.

1 2. The laser system of claim 1, wherein the thermal expansion of the
2 member effects a predetermined change in the angle of the non-linear optic when the non-
3 linear optic undergoes the change in temperature, and wherein the predetermined change
4 in the angle effects a desired adjustment in the conversion.

1 3. The laser system of claim 2, wherein the conversion provided by
2 the non-linear optic also varies with a temperature of the non-linear optic, and wherein
3 the angle-induced adjustment in the conversion compensates for temperature-induced
4 changes in the conversion by the non-linear optic.

1 4. The laser system of claim 3, wherein the non-linear optic is pivoted
2 by the member within the optical path so that the second frequency remains within a
3 desired range when a temperature of the non-linear optic varies throughout a
4 predetermined temperature range during operation of the laser system.

1 5. The laser system of claim 1, further comprising a second member
2 attached to the first member, the second member having a second coefficient of thermal
3 expansion, the second expansion coefficient being different than the first expansion
4 coefficient, wherein differential thermal expansion alters a bend angle of the attached first
5 and second members, the angle of the non-linear optic being mechanically coupled to the
6 bend angle.

1 6. The laser system of claim 1, further comprising a beam control
2 system for selectively directing the beam onto a cornea of a patient so as to effect a
3 desired refractive change, the laser system comprising a laser eye surgery system.

1 7. The laser system of claim 6, wherein the laser comprises a solid-
2 state laser, and wherein a frequency of the beam incident on the cornea is in a range from
3 about 180 to about 210 nm.

1 8. A laser eye surgery system comprising:
2 a laser generating a laser beam with a first frequency;
3 a non-linear optic disposed in an optical path of the beam so as to define
4 an angle relative to the beam, the non-linear optic effecting a conversion of the first
5 frequency to a second frequency, wherein the conversion has an angle-induced change in
6 with a change in the angle, and wherein the conversion has a temperature-induced change
7 with a change in a temperature of the non-linear optic;
8 a compensator including a first member having a thermal coefficient of
9 expansion, the first member thermally coupled to the non-linear optic so that the change
10 in temperature of the non-linear optic effects a change in a dimension of the first member,
11 the first member mechanically coupled to the non-linear optic, the change in dimension of
12 the first member effecting the change in angle of the non-linear optic so that the angle-
13 induced change in the conversion compensates for the temperature-induced change in the
14 conversion; and
15 a beam directing system in the optical path from the non-linear optic, the
16 beam directing system selectively directing the beam toward portions of a cornea so as to
17 effect a desired change in a refractive characteristic of the cornea.

1 9. A method comprising:
2 generating a laser beam at a first frequency with a laser;
3 converting the beam to a second frequency with a non-linear optic,
4 wherein the converting step varies with a temperature of the non-linear optic and with an
5 angle defined by the non-linear optic and the laser beam;
6 passively compensating for temperature-induced variations in the non-
7 linear optic by transferring heat to a member from the non-linear optic so that thermal
8 expansion of the member adjusts the angle of the non-linear optic.
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